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ON THE ASSAY OF OPIUM.

By Wm. T. Hankey.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—No. 84.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, Feb. 17.

It was observed when making comparative assays of powdered opium by the U. S. P. and Squibb's processes, that the latter always yielded higher results to the extent of ½ to 2½ per cent. This difference appeared to be in greater part due to the presence of calcium meconate, which was precipitated in the latter process along with the morphine. It has been suggested by Charles M. Stillwell[1] in 1886 to dissolve the morphine obtained by the Squibb process by treatment with hot absolute alcohol, weigh the insoluble residue and deduct it from the total in order to arrive at a true result. This method was tried in a number of instances, but was found to require a considerable amount of time as well as absolute alcohol.

At the suggestion of Prof. Trimble, I divided a sample of morphine obtained by the Squibb process into two equal portions. One portion was ignited to constant weight and the ash estimated. The other portion was washed with hot absolute alcohol, the insoluble residue ignited and the ash found to weigh the same as that obtained from the first portion, showing that the absolute alcohol extracted nothing that would yield any ash on ignition: this was verified by igniting a portion of the morphine recovered from the absolute alcohol.

Another sample of morphine was taken which had been obtained from powdered opium, assaying 15·75 per cent. by the Squibb pro-

[1] *American Chemical Journal*, vol. 8, p. 295.

cess and 14·40 per cent. by the U. S. P. process. The entire amount of morphine obtained by the Squibb process was divided as before, into two equal portions. One portion was ignited and the ash found to weigh ·010 gm., which would be ·020 gm. for the entire quantity. The other portion was washed with hot absolute alcohol and the insoluble portion dried to constant weight in an air-bath at 80° C., when it weighed ·046 gm., which would be ·092 gm. for the entire quantity. Assuming that the insoluble portion was meconate of calcium $Ca(C_7H_2O_7).H_2O$ (Mol. wt. 255), its ash, after ignition, would be calcium oxide CaO (Mol. wt. 56). Since 100 parts of calcium meconate represent 21·96 parts of calcium oxide, it is only necessary to multiply the amount of calcium oxide found by 4·55 to get the amount of meconate.

In the above instance, ·092 gm. of calcium meconate was found by treating the morphine with hot absolute alcohol; and 0·20 gm. of calcium oxide was found by igniting a part of the same morphine ·020 × 4·55 = ·091. Deducting ·092 and ·091 gm. from 15·75, the per cent. of morphine found we obtain, respectively, 14·83 and 14·84 per cent., figures which are sufficiently close to be entirely satisfactory.

Several different samples of powdered opium were obtained and assays made of each by the U. S. P. and the Squibb processes. The morphine obtained by the latter process being subsequently submitted to the treatment as described above with the following results:

No.	Per Cent. of Morphine by Squibb Process.	Ash of Morphine obtained by Squibb Process, consisting of CaO.	$CaC_7H_2O_7.H_2O$ Calculated from Weight of Ash, Squibb Process.	$CaC_7H_2O_7.H_2O$ Found by Treatment with Hot Absolute Alcohol, Squibb Process.	Per Cent. of Pure Morphine by Squibb Process, after Deducting $CaC_7H_2O_7.H_2O$.	Per Cent. of Morphine by U. S. P. Process.
I	14·70	·024 Gm.	·109 Gm.	·110 Gm.	13·60	13·40
II	12·05	·013 "	·059 "	·059 "	11·46	11·30
III	13·62	·014 "	·064 "	·063 "	12·98	12·50
IV	14·90	·037 "	·170 "	·170 "	13·20	12·84
V	15·75	·020 "	·091 "	·092 "	14·84	14·40
VI	16·35	·049 "	·223 "	—	14·12	14·02

The morphine obtained from the different samples by the U. S. P. process was found to yield only a trace of ash on ignition.

It will be noticed that after deducting the meconate of calcium the Squibb process still shows a larger yield of morphine than the U. S. P. process indicates.

In conclusion it may be stated that it has been deemed preferable by many to use the Squibb process with the modification as suggested by Stillwell instead of the U. S. P. process, as it does not require as much time to carry out, and it gives a larger yield of morphine.

I would suggest that the morphine obtained in opium assays by Squibb's process, instead of being treated with hot absolute alcohol, as suggested by Stillwell, be ignited at a high temperature, care being taken to apply sufficient heat to convert the calcium meconate into calcium oxide, the ash weighed as calcium oxide and the amount of calcium meconate estimated by multiplying the weight of the ash by 4·55. The weight of the meconate of calcium is then to be deducted from the weight of the impure morphine leaving the true amount of pure morphine.

Dr. Squibb has suggested that the morphine by his process be purified by solution in calcium hydrate solution. This, however, is not so convenient or accurate as the purification by absolute alcohol and, as I have determined by experiment, not to be compared with the method above given.

BIMURIATE OF QUININE.

By George M. Beringer, Ph.G.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, Feb. 17.

A query submitted at the last Pharmaceutical meeting asked for information regarding the composition and manufacture of this salt. Attention has recently been directed by a manufacturer of pharmaceutical preparations in Philadelphia to the advantages possessed by the hydrochloric acid salts of quinine over those of sulphuric acid. Increased solubility, larger percentage of alkaloid and better assimilation of a hydrochloric acid salt being the advantages claimed, and this it is supposed has suggested the query.

Beurmann and Villejean in L'Union Pharmaceutique, for August, 1890, call attention to the value of bichlorhydrate of quinine for subcutaneous injection. They state "that bichlorhydrate is the most soluble salt of quinine; it is as rich in alkaloid as the

monochlorhydrate; its solution in distilled water may be preserved without change; it can be employed without any preliminary precautions, and is sufficiently concentrated to permit the injection of 50 to 75 cgm. of active salt. There is accordingly no need of multiplying the injections, which, however, do not produce anything more than a slight pain, and do not give rise to any accidents, either local or general." A number of prominent physicians connected with the Paris hospitals are cited as attesting to the results obtained.

The solution recommended for use is: Bichlorhydrate of quinine, 5 gm.; distilled water q. s. to make 10 cc. (Druggist's Bulletin, September, 1890, page 320.)

A sample of that supplied in this city was examined by the writer. It was in the form of an amorphous powder, strongly acid to moistened test paper, and readily soluble in less than two parts of water at the temperature of the atmosphere. One gramme heated on the water-bath for 2 hours lost but ·002 gm. and after 4 hours but ·004 gm. One gramme, on being treated with acidulated silver nitrate solution, yielded ·690 gm. silver chloride corresponding to 17·55 per cent. hydrochloric acid. Precipitated with soda, and the precipitate collected and washed with distilled water saturated with freshly precipitated quinine, it yielded 81·3 per cent. of alkaloid.

A prominent manufacturer of quinine salts was interviewed on this subject, and kindly offered to make an examination of the product. He subsequently wrote me as follows: "The sample of bimuriate of quinine contains:

	Per Cent.
Quinine,	81·0
Hydrochloric acid,	17·5
Water,	1·5
	100·0

Heated on the water-bath for 2 hours it lost only 0·2 per cent. of hydrochloric acid, showing it to be a stronger combination than the books indicate. It is very soluble in cold water. We have made some which contains 18·3 per cent. of hydrochloric acid, or very nearly the theoretical quantity."

The term normal quinine hydrochloride has been applied to this product by several writers in contradistinction to the so-called basic

hydrochloride, the hydrochlorate of quinine of the pharmacopœia. In the writer's opinion, the proper title for the latter should be quinine hydrochloride, and for the acid salt quinine bihydrochloride.

A. Clermont (Year Book of Pharmacy, 1888–84) states *normal hydrochloride of quinine* $C_{20}H_{24}N_2O_2,2HCl$ is readily obtained in solution, either by mixing equivalent solutions of normal quinine sulphate and barium chloride, or by adding an equivalent of hydrochloric acid to a solution of basic quinine hydrochloride. The solution obtained by either process when evaporated to dryness below 100° C. yields the normal salt.

In my opinion the following is the best method of preparing this salt:

Quinine, precipitated, washed and dried at a temperature not exceeding 50° to 52° C. (120°–125° F.),	37·8 gm.
Hydrochloric acid, sp. gr. 1·16,	22·82 gm.
Water,	60 cc.

Mix the acid and water, add the quinine, filter if necessary, and carefully evaporate to dryness.

Schorlemmer (Chemistry of Carbon Compounds, page 478) states *normal quinine hydrochloride* does not crystallize well, and is decomposed by water into the basic salt and free acid. By adding platinic chloride to its solution the double salt $C_{20}H_{24}N_2O_2(HCl)_2 + Pt_2Cl_4 + H_2O$ is obtained as a pale yellow precipitate, which on standing changes into orange-red crystals.

ON TINCTURE OF NUX VOMICA.

By Alfred B. Taylor.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, Feb. 17.

It has been suggested that Tincture of Nux Vomica should be made by dissolving the solid extract in alcohol. Would such a change in the Pharmacopœia be desirable?

An affirmative answer to this query would at first sight appear to be the proper one, and it might be thought to be an improvement on the present official process. Since the Pharmacopœia directs that the tincture shall contain two grains of dry extract in each 100 grains of tincture, and the extract can be readily obtained, much time and trouble would be saved by the change.

The tendency of modern pharmacy is towards greater accuracy

and precision, and all processes having these objects in view deserve favorable consideration.

The Pharmacopœia of 1880 has been severely criticised for giving directions that the tincture should contain 2 per cent. of dry extract, and it has been argued that this provision was given as a test, and that any tincture which contained 2 per cent. of dry extract of Nux Vomica was official without regard to its containing any of the proper alkaloids; and on the other hand, it was not official if it did not contain 2 per cent. of extractive matter, regardless of its alkaloidal strength.

The virtues of this tincture depend perhaps entirely upon the amount of alkaloids contained therein, without any reference whatever to the amount of extractive matter; and since the Pharmacopœia has said nothing about these alkaloids, it has not set up any standard by which this preparation is to be judged.

The Pharmacopœia of 1870 directed the tincture to be made by percolation, and of the strength of 8 troy ounces to two pints, leaving it entirely to the skill and judgment of the pharmacist as to whether his drug was exhausted or not. In the Pharmacopœia of 1880, in order to more fully insure the exhaustion of the drug, the direction was given that each 100 parts of the tincture, when prepared according to the formula, should contain 2 parts of dry extract; this direction was given not as a standard nor as a test of the strength of the tincture, but simply as a guide to the pharmacist, to show whether his drug had been properly exhausted. It took for granted that he would use a good quality of Nux Vomica, such an article as would be recognized by the Pharmacopœia; and if he did so, and carefully followed the directions, he would get a good preparation. This was a step in the right direction, but it did not go far enough. The methods of assaying Nux Vomica were not as well known in 1880 as they are at present, and it is probable that in the next Pharmacopœia an assayed or standardized preparation of Nux Vomica will be introduced.

If a weaker menstruum than that which is official should be used, the amount of extractive matter would be larger, and consequently it would contain a smaller percentage of alkaloids, even supposing that the whole of the alkaloids were extracted, which is not probable. Hence the guide that the tincture should contain two per cent. of dry extract is not applicable to any extract not prepared strictly according to the Pharmacopœia.

As appears from recent investigations upon this subject, the various extracts of Nux Vomica found in the market differ very greatly in quality, some containing the proper amount of alkaloids, while others, and these the great majority, contain considerably less, and some not any.

From these considerations it is clearly evident that no extract which is not prepared according to the U. S. Pharmacopœia should be used for making the tincture, and no pharmacist is justified in using for this purpose, an extract of the preparation of which he is ignorant, unless he assays it and finds it to contain the proper amount of alkaloids.

I therefore have no hesitation in saying that the proposed change is not desirable.

NOTES ON PRACTICAL PHARMACY.

By Joseph W. England, Ph.G.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, Feb. 17.

The following notes on practical pharmacy have been the result of the writer's experience, mainly in the direction of preparation of the officinal galenicals. The question as to how far a pharmacist is justified in going in an alteration or modification of an officinal formula, is, I think, best answered in this way: To the extent in which there is no alteration of therapeutical action, diminution in strength, nor decided change in obvious physical properties. It goes without saying that the therapeutical activity of the drug should remain unchanged or else the preparation will not represent the drug from which it is made, and that the strength should be maintained or else unreliability will result. Just to what extent the physical character of a preparation may be modified is dependent upon the circumstances of each special case; as to whether the pharmacopœial process is particularly faulty, or whether it will not yield the results claimed for it, or whether it can be improved without cost to its therapeutical value and strength of drug.

Compound Chalk Powder.—This new officinal powder, for the extemporaneous preparation of chalk mixture, can be improved in its making by adding oil of cinnamon directly to the powder, and making the mixture up with water, as needed. To each troy ounce add 4 minims of the oil of cinnamon. Criticism has been made upon the large amount of sugar in this powder—one

half. As the mixture is most largely used for diarrhœa or intestinal relaxation, accompanied with acidity, often the result of food fermentation, the use of any sugar would seem to be therapeutically objectionable, as it merely increases the fermentation. A much better plan would be to replace all the sugar with powdered acacia. Further, in view of the mild astringent influence of cinnamon water, it is better to make the mixture up with all cinnamon water instead of equal parts of it and water, as directed by the U. S. P., '90. Save the use of a small quantity of syrup ($\frac{1}{16}$), the British Ph. recommends the former.

The officinal mixture contains 100 grains of powder to the fluid ounce. It is too weak and should be, at least, 2 drachms to the fluid ounce.

Some physicians use chalk, powdered cinnamon, acacia and water. This does not make as elegant a preparation as the officinal, but the tannic acid in the powdered cinnamon adds greatly to its therapeutical value.

Weighing Iodine.—It is, of course, inadmissible to weigh iodine directly upon metallic pans, and paper decomposes so quickly on contact with it, that the pans underneath are also attacked. In the absence of glass or horn pans, the best substitute is paraffin paper.

Sodium Bromide.—Through a prominent firm of manufacturing chemists, I have learned of an apparent inconsistency in the percentage of sodium chloride permitted by the present Pharmacopœia in this compound. Under bromine the officinal maximal limit of free chlorine is 3 per cent., while under sodium bromide the maximal limit of sodium chloride is also 3 per cent., which, of course, is inconsistent. The error probably arose in following too closely the German Pharmacopœia, which makes the maximal limit of chloride in NaBr 3 per cent. But no notice was taken of the fact that American bromine always contains more free chlorine than German bromine, and, since the manufacturers have no practicable method of separating the chlorine in its entirety, the maximal limit of chloride in sodium bromide should be made not less than 5 per cent.

Wine of Antimony.—Physicians complain that the officinal wine of antimony is entirely too weak in tartar emetic. The first editions of the Pharmacopœia made it 4 grains to the fluidounce. The

present edition makes it 1·8 grs.; a reduction of 55 per cent. The writer has furnished a satisfactory preparation by averaging the two extremes and making it 3 grains to the fluidounce.

Ammonia Water Containers.—The best method for preservation of ammonia water in containers that the writer has found is a common cork, covered with a piece of cheese cloth, and this covered with a piece of paraffin paper. An ordinary glass stopper is totally insufficient to prevent some of the vapor from escaping, while the dark coloration, produced by contact of the ammonia with cork tissue alone renders the use of corks objectionable.

Spirit of Camphor.—The officinal dilution in alcoholic strength of 20 per cent., with water, is inadmissible for the reason that when it is prescribed with volatile oils, turpentine, soap liniment, etc., as is often done in making stimulating liniments, there is precipitation of camphor, or rather, a deficiency in the amount dissolved that would have remained in solution had the spirits of camphor been made with strong alcohol, as in the U. S. P. '70 formula.

Spirits of Peppermint and Spearmint.—The officinal formulæ of these two preparations can be improved by macerating the herbs with alcohol, filtering and dissolving the oils in the filtrate. It is needless to say that filtration without the presence of dissolved oils is much more rapid than with their presence. Turbidity in these spirits, arising from undissolved oils or more probably from traces of resinified oil, can be removed by agitating the liquid with long narrow strips of a sheet of filtering paper and filtering. Sometimes the addition of a small quantity of precipitated phosphate of calcium is also necessary.

Compound Tincture of Lavender.—This preparation which has been very largely replaced by the increasing popularity of compound tincture of cardamom, can have its officinal formula improved by exhausting the drugs with the menstruum first, and then dissolving the volatile oils in the percolate. By this means the drugs are more readily exhausted and the preparation more quickly made.

Solution of Magnesium Citrate.—For causing effervescence, a very elegant substitute for the acrid potassium bicarbonate is Merck's sodium bicarbonate "in crusts." It gives a pleasant saline taste to the preparation, instead of the usual bitter, acrid one.

Compound Syrup of Hypophosphites.—Glycerin in the proportion

of two fluidounces to the pint greatly increases the therapeutical value of this preparation.

Ammonium Carbonate.—Therapeutists agree that the diffusible stimulant action of ammonium carbonate is best represented in the hard clearly-crystalline variety, and that the effloresced product is for practical purposes therapeutically valueless by comparison.

This is why many physicians in their prescriptions specify the "clear" or "crystalline" variety. They have found the effloresced powder valueless.

Why ammonium carbonate effloresces on exposure to air is easy of explanation when we remember its chemical composition of acid carbonate and carbamate—a dehydrated normal carbonate—and that the latter readily absorbs water and carbonic acid gas (from the air) to become an acid carbonate.

How best to prevent this change has always been a most difficult question. For this purpose I have been using for the last five or six months an expedient which has answered admirably. It consists simply in placing medium-sized lumps of the salt in a museum or fruit jar (glass top), preferably upon a porcelain or glass support, to keep them from touching the bottom of the container, and then adding a small quantity of stronger ammonia water and closing. The ammonia gas neutralizes the carbonic acid gas in the air of the container, and the salt remains hard and densely crystalline. I here present for inspection some ammonium carbonate over four months old preserved by this method.

A CARBOY ROCKER.

By J. F. Stevenson.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, Feb. 17.

Having for many years felt the necessity for a better means of supporting a carboy while pouring a liquid from it, it occurred to the writer to adopt a method or principle which had not previously been used. The methods usually employed depend upon the suspension of the carboy, upon opposite sides, at a point slightly above the centre of gravity and carboy cradles, trunnions, and other means have been used for the purpose of carrying out this principle.

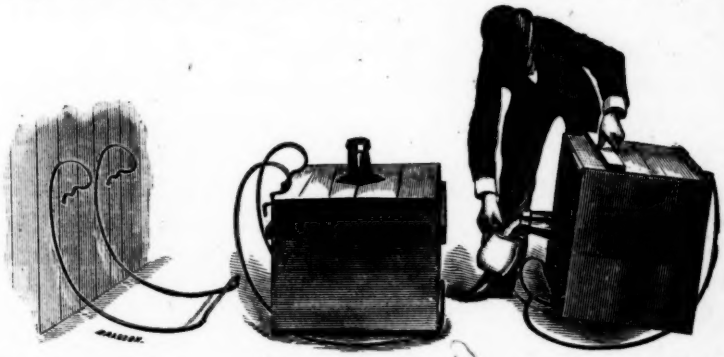
These methods have not produced results which are thoroughly

satisfactory; the cradles being cumbersome and requiring two persons to lift the carboy into the cradle.

The use of trunnions is objectionable, because it necessitates the defacing and weakening of the sides of the carboy.

It occurred to the writer to take a steel rod about fifteen feet long and to bend it into the shape of a pair of parallel bows joined at one end; after carefully tempering the steel so as to secure the maximum of rigidity, toughness and elasticity, the carboy rocker, as it is now termed, was ready for trial.

In order to put the Carboy Rocker into actual use, say for drawing oil of vitriol from a loaded carboy, the carboy is tilted first on its bottom edge, and then raised along this edge, until it rests on the bottom corner (a carboy is easily held in this position by one person), one of the arms of the rocker is now grasped, and the con-



necting brace of the rocker inserted under the elevated bottom edge, the carboy is then carefully lowered into its original position, when the angles of the front part of the bows will usually slip into their places on the top of the carboy, through the elasticity of the steel springs, without further adjustment.

The advantages shown that this apparatus possesses, is simplicity of construction, durability (as it is practically indestructible) and cheapness; the curves are so adjusted as to cause the carboy, when not in use, to assume a safe, upright position, and at the same time the upper portion is curved so as to project above the top of the carboy sufficiently, so as to permit the draining of the last drop from the carboy when it is inverted.

Collodion of Salol, useful in acute rheumatism, is obtained by dissolving salol 4, in ether 4, and adding to collodion 30 parts.—*Rép. de Phar.*

PREPARATION OF UNGUENTUM HYDRARGYRI.

Editor AMERICAN JOURNAL OF PHARMACY:

In my examinations of the various works on pharmacy published, I have failed to discover a formula like that by which I have prepared mercurial ointment for the last five years. In view of the great saving of time, it may be of general interest to the profession. By this formula the mercury can be extinguished *inside of fifteen minutes*. It is as follows:

Mercury, 8 parts.
Mercurial ointment, 1 part.
Petrolatum, 1 part.
Lard, 6 parts.

The formula will work better with all petrolatum instead of lard, and so prepared, the mercury will be incorporated more quickly, and the ointment never turn rancid.

Please state in your valuable journal if there is any objection to its use. Yours, etc.,

CHARLES E. KING.

CINCINNATI, February 9, 1891.

[NOTE.—The editor can see no objection in substituting petrolatum for a portion of lard, as recommended in the formula given above. The Pharmacopœia directs equal weight of lard and suet; and a firmer consistence would result if in the above formula a similar course was followed.]

Carpaine is the name of a new alkaloid, discovered by Dr. M. Greshoff, in the leaves of Carica Papaya. The fruit and the milky juice of the Papaya plant contain only traces of it; the leaves 0·25 per cent. (calculated on the dry substance). It is very bitter; limit of detecting this taste, 1 : 100,000. It responds to all the alkaloidal group reactions; yields Prussian blue by Lassaigne's N test; is alkaline to red litmus; has no color reactions of its own, with Fröhde's reagent; melting point, 115° C.; crystallizes in "needles." Physiological experiments with it are very desirable. (Mededeelingen uit 's lands plantentuin, Batavia, 1890).

Dr. Greshoff is director of a newly erected laboratory for chemico-pharmaceutical investigations into the value of plants growing in Dutch East India. The laboratory is situated in the beautiful botanical garden at Buitenzorg, Java. J. B. N.

PHARMACEUTICAL NOTES.

Abstracts from Theses.

Collodium stypticum.—Noticing that the pharmacopœial preparation deposits a sediment containing tannin, John S. Mack, Ph.G., suggests the following formula, which will yield an efficient and clear preparation. For preparing one fluidounce dissolve 65 grains of tannin in a vial containing a mixture of 91 minims of alcohol and 306 minims of stronger ether, pass through a small filter contained in a well-covered funnel, wash the filter with a little of the same menstruum, dissolve in the filtrate 8½ grains of guncotton, set aside for a few days, and decant from any undissolved particles.

Syrup of Eriodictyon, if prepared according to the "National Formulary," causes in quinine mixtures precipitation instead of keeping the quinine in suspension. This is obviated by dispensing with the solution of potassa, and manipulating as follows, as suggested by Edward P. Sheafer, Ph.G.: Prepare from ½ ounce of yerba santa, by maceration with cold water, 6 fluidounces of infusion; add to this a solution of 4 drops each of the volatile oils of lemon, cloves and sassafras in ½ fluidounce of alcohol; filter through purified talcum; add to the filtrate 13 troy ounces of sugar; dissolve without heat, and add through the filter previously used enough water to make the product measure 16 fluidounces.

Tinctura Vanillæ is obtained of a beautiful deep brown color and representing the aromatic properties of the drug in a very satisfactory degree, by modifying the menstruum and manipulation directed by the Pharmacopœia, Chas. P. Hendrickson, Ph.G., suggesting the following: Reduce to a uniform powder 10 parts of vanilla, cut into small pieces, by beating it in a mortar, in small portions, with 10 parts of rock candy; mix this uniformly with 75 parts of sand, previously washed and dried; pack the mixture firmly in a cylindrical glass percolator, and then obtain in the usual manner by maceration and displacement, 100 parts of tincture, using a menstruum composed of 50 parts alcohol, 15 of glycerin, and 35 of water.

Tinctura Gentianæ composita, it is suggested by Francis W. Cook, Ph.G., should be prepared with a stronger alcoholic menstruum, to avoid the deposition of an unsightly precipitate, which takes place in the pharmacopœial tincture. The materials sug-

gested are: Gentian, 8 parts; bitter orange peel, 4 parts; cardamom, 2 parts; water, 21, and alcohol 65 parts.

Glycerin, of which eight different samples were examined by Edwin A. Prior, was found to be practically pure. A sample of so-called *mineral glycerin* was found to have a density of 0·866, and judging from its behavior with alkalies, alcohol, ether, chloroform, benzin and benzol, was simply a handsome paraffin oil.

A PROXIMATE ANALYSIS OF THE BERRIES OF HORSE NETTLE.

(*Solanum carolinense* L., order *Solanaceæ*.)

By Harry Kahn.

Growing in sandy places, in pastures and sometimes in cultivated grounds in Virginia, the Carolinas, as far north as Pennsylvania and west as far as Iowa, horse nettle may be found. The root is perennial, while the hollow, erect, armed stem is annual, growing to a height of from one to two feet. Its leaves are from four to six inches long, ovate oblong, acute, sinuated-toothed or angled, have a roughish white stellate pubescence, and are prickly along the midrib (Gray, *Manual of Botany*, *339*). Petioles from ½ to 1½ inches long. Racemes lateral, opposite and often larger than the leaves. The flowers which appear in June, July and August have a pale blue or white corolla and a five-parted aculeate calyx.

The berries ripen in October; are two-celled; from ¼ to ⅓ inch in diameter; of a lemon yellow or greenish yellow color (Darlington, *American Weeds and Useful Plants*, 1859, 254). When fresh they have a rank wild odor, but when dried this is changed to a pleasant aromatic; they have a slightly bitter taste, with a tingling aftertaste.

According to Porcher (quoted by Maisch in American Journal of Pharmacy, **61**, 552), these berries have some reputation among the negroes of South Carolina as an aphrodisiac. Valentine obtained good results from the juice in tetanus. A tincture of the same has recently been used with much success by J. L. Napier (*Virginia Medical Monthly*, Sept., 1889. Smead: *Notes on New Remedies*, *351*), as a remedy for epilepsy. Hare in his "*Epilepsy: its pathology and treatment*," also recommends the use of horse nettle berries.

The analysis of the drug is not as complete as might be wished,

it having been impossible to carry out a very extended investigation on account of the limited amount of material at hand. The well-known scheme suggested by Parsons (Prescott's *Organic Analysis*, 1887, *408*; AMER. JOURNAL OF PHARMACY, 1880, p. 210; *Pharmaceutical Journal and Transactions* (3) 10, *793*) was in the main followed, but the details were modified.

(1) A volatile oil, (2) a fixed oil, (3) an acid resin, and (4) from a "Prollius liquid" extract evidence of an alkaloid were obtained. The latter being present in such a small quantity its isolation was not attempted.

(1) The volatile oil has a very characteristic odor and a specific gravity less than 1·000. (2) The fixed oil was separated from the chloroform extractive by treating the extractive with a small quantity of petroleum spirit, filtering and evaporating off the spirit. This oil is of a green color, has a bland taste, and is easily saponified by alkalies, forming a light green soap, which is readily soluble in water. When eight drops of the oil were placed in a watch glass over white paper, and two drops of sulphuric acid added, at first a brown color was observed, afterwards strings of black beginning to appear. On stirring, the whole turned black except the edge, which was seal brown. Nitric acid in the cold has no effect, but if three drops of the oil and two of the acid be placed in a small test-tube and heated to boiling a brown color will be observed. With an aqueous solution of silver nitrate a white precipitate was obtained. (3) The resin was extracted from the drug in part by the chloroform and in part by the 80 per cent. alcohol. It is of a light yellow color, and is soluble in the alkali hydroxides.

Nitrogen corresponding to 14·45 per cent. of albumen was found, of which some was soluble in water, but the greater part was dissolved by sodium hydroxide.

The percentages of the above-mentioned constituents together with those of the substances common to all plants will be found in the following summary:

	Per Cent.
Ash,	6·68
Volatile oil,	3·22
Fixed oil,	9·75
Resin,	2·81
Waxy matter,	1·85
Organic acids and allies,	4·18

	Per Cent.
Glucose,	1·30
Extractive (containing alkaloidal matter),	18·36
Gum,	3·02
Colored extractive and albuminoids,	9·57
Inert coloring matter,	1·73
Starch and allied substances,	6·69
Sodium hydroxide extractive,	12·30
Cellulose,	15·85
Loss,	2·69
Moisture in fresh berries,	77·79

UNIVERSITY OF MICHIGAN SCHOOL OF PHARMACY,
February, 1891.

For constituents of the root-bark and of the leaves of the horse nettle, see papers by G. A. Krauss, in AMER. JOUR. PHARM., 1890, p. 602, and 1891, p. 65.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

PREPARATION OF BROMOFORM.—A simple process, described by M. Denigès, in the *Bull. de la Soc. de Phar. de Bordeaux*, consists in treating acetone by a solution of hypobromite of soda, a method similar to that of Suillot for iodoform and to Sadtler's process for chloroform. M. Denigès makes a mixture of 100 ccm. of each, soap-maker's lye and distilled water, adding 20 ccm. of bromine. The reaction terminated, he adds, with agitation, a sufficient quantity of acetone (about 10 ccm.) to cause the disappearance of the yellow coloration of the solution of hypobromite of soda. A nearly colorless liquid layer of bromoform appears. After washing, the bromoform may be separated in a nearly pure state. A pure article is obtained by rectification, saving the product which passes over between 148° and 152°. Theoretically, the product should be 53 parts of bromoform to 100 parts of bromine, but we get only 35 parts, or 60 to 70 per cent. of the theoretical product. The loss is due to the formation of the bromide and bromate of soda simultaneously with the hypobromite.—*Répert. de Phar.*, Jan. 10.

SALOL IN INFANTILE DIARRHŒA.—The doses given by Dr. Moncorvo (Rio Janeiro) are thus stated in *Nouv. Rem.*, Jan. 8: The amount given in 24 hours may be varied from 15 cgm. to 2 gm., according to the gravity of the case. The medicament is well borne by children of all ages, and the physician has observed no toxic

phenomena from its use. Gases resulting from intestinal fermentation do not further appear after its ingestion, and colic and vomiting soon cease. The intestinal flux soon moderates and disappears under the influence of salol.

CUTANEOUS ABSORPTION OF LARD AND VASELIN.—M. M. Adam and Schoumacher (*Rev. de méd. vét.*), prepared ointments of lard and varied quantities of hydrochlorate of strychnine, which they applied (without friction) to the shaved scalps of dogs. An ointment of 8 gm. of lard and 5 cgm. of strychnine produced no toxic symptoms; one of 50 cgm. of strychnine determined slight hyperæsthesia; one of 2 gm. of the salt, to 8 gm. of lard brought about a tetanic attack within 3 minutes, in a dog weighing 5 kilogrammes; he died in 20 minutes. A dog of 36 kilogrammes died in 12 hours. With ointments containing 2 gm. of strychnine and 8 gm. of vaselin, the authors observed no signs of intoxication.—*Répert. de Phar.*, Jan.

INNOCUOUSNESS OF STRONTIUM SALTS.—In a paper read before the *Société de Biologie* (Paris, Dec. 13, 1890) Professor Laborde stated that the salts of strontium were not toxic, even when given for relatively long periods of time. They produced diuretic effects, however, and these have been substantiated, clinically, by Professor Sée, who used the lactate and the tartrate of strontium. Care should be taken to obtain pure salts for clinical use. Dr. Laborde thought that strontium exercised a preservative action upon organic tissues, liquids and excretions. He said that the contrast between the extreme toxicity of baryta and the harmlessness of strontia constituted an interesting fact for chemists, which must revolutionize current notions that chemical relationship decides any analogy in toxic or other physiological action.

SALICYLATE OF MERCURY AS A SURGICAL DRESSING.—In a report to the *Société de Chirurgie* (Paris, Dec. 27, 1890), M. Vacher said that the obstacle to use of this salt in the manner described lay in its insolubility. He overcame this by causing the salicylate of soda to react upon the bichloride of mercury. The double decomposition gave rise to salicylate of mercury and chloride of sodium, and the latter salt added to the solvency of the former. The solution thus obtained has no irritating properties. Dr. Vacher used solutions of 1 to 1,000 of the salicylate of mercury, which he prepared in accordance with the following formula: Corrosive sublimate, 1 gm.; salicylate of soda, 2 gm.; distilled water, 1,000 gm.

Solutions of 1 to 5,000 may be prepared by adding to the above, four times its weight of water. The author used salicylate of mercury (as an antisyphilitic) both hypodermically and by the mouth. For internal medication he gave 15 to 20 gm. daily of the 1 to 1,000 solution. For subcutaneous injections he gave a 1 to 100 solution, prepared as above, so that 1 ccm. would represent about 1 cgm. of salicylate of mercury. The injections did not cause pain or abscess.

Copper Colorations of Vegetables.—At a meeting of the Paris Society of Pharmacy, Dec. 3, 1890, a paper by M. Mestre was discussed, in which the author claimed that the copper colorations existing naturally or artificially in vegetables, are perfectly harmless. He said that there was often less copper in colored conserves than in many unsuspected aliments, and the copper was found only in conditions of difficult solubility. In colored peas the average proportion of copper present was 7 cgm. to ½ kilogramme, but he had found as much as 21 cgm. The average quantity in beans was 56 mgm.; the maximum quantity was 99 mgm. Bread, he stated, contains an average of 5 mgm. of copper per kilogramme, and wheat 5 to 10 mgm. Preparations of pork contained 51 mgm., and those of geese 35 cgm. Chocolate contained 36 mgm. The conclusions of the author were that people might use and abuse the privilege of employing colored vegetables without feeling toxic effects from the copper contained in them.

Arsenical and Antimonial Stains: Their Differentiation.—Azotized solutions of molybdate of ammonia have long been used in searching for arsenic, but no one seems to have applied its reaction for the differentiation, in toxicology, of spots made by arsenic from those made by antimony. While it may be said that the arsenio-molybdate and the phospho-molybdate of ammonia present identical characters, we know that no trace of phosphoric compounds can exist in stains of arsenic or antimony furnished by Marsh's apparatus, it is proper to affirm the presence of arsenic when we obtain crystals of arsenio-molybdate of ammonia in the manner about to be described. The suspected spots, brought together in a porcelain capsule, are treated with 3 or 4 drops of pure nitric acid, which will dissolve either arsenic or antimony. The solution is heated for a few minutes and, on removal, treated with 4 or 5 drops of molybdate of ammonia in azotized solution.

Even if there be but traces of arsenic present ($\frac{1}{50}$ to $\frac{1}{100}$ mgm.) a yellow precipitate is formed, which, under the microscope, shows stellar forms with triangular branches disposed in rectangular fields. Antimony gives no analogous result with the molybdic reagent. In the present state of science, this reaction seems to be the most sensitive and the most characteristic for arsenic. The molybdic reagent is made as follows: Dissolve with gentle heat, 10 gm. of molybdate of ammonia and 25 gm. of nitrate of ammonia in 100 ccm. of water. Cool and add slowly, with agitation, 100 ccm. of pure nitric acid having a density of 1·20. Place on a water-bath for ten minutes, cool, and set aside for forty-eight hours. Filter through paper washed with diluted nitric acid and keep in glass stoppered bottles.—*Compt. rend., Répert. de Phar.*, Jan. 10.

To Solder Metals to Glass and Porcelain.—M. Cailletet lately communicated to the *Société de Physique* a process for the above, which he thought would be valuable to chemists. The tube or piece to be affixed is first covered, by means of a brush, with a thin coating of chloride of platinum, mixed with oil of chamomile. The oil is volatilized with gentle heat and the tube heated to a dark red color, when it takes a metallic lustre. It is then placed in a copper bath and the negative pole of a battery attached, when it will soon be covered with a very close-fitting, adherent, malleable plate of copper. In this condition, the glass or porcelain tube may be soldered with tin to iron, copper, platina, etc. The resistance offered by fixtures treated in this way is very great. M. Cailletet tested them in boilers having a pressure of 300 atmospheres. Nitrate of silver may be used instead of chloride of platinum, but the latter is preferable.—*La Nature; Nouv. Rem.*, Feb. 8.

Transference and Vitrification of Photographs.—A pulverized, vitrifiable color is mixed with gum arabic and water and spread uniformly upon a piece of somewhat thick rag paper. This is dried, and, 12 hours before it is used, it is passed quickly through a solution of oxalate of iron and again dried. It is then pressed and exposed to the solar ray under the photographic negative whose image is to be transferred to porcelain. The leaf is now placed for a few moments in distilled water and is then pressed firmly upon the porcelain object, which is then placed in water. The paper becomes slowly detached, leaving the impression. The object should be carefully dried, and may then be vitrified in a furnace.—*Rev. sci.; Nouv. Rem.*, Feb. 8.

GLEANINGS FROM THE GERMAN JOURNALS.

By Frank X. Moerk, Ph.G.

Ichthyol-preparations, which can be removed by washing with water, are proposed by Unna (*Monatsh. f. Derm.* 1891, No. 2): Ichthyol 40, starch 40, cold water 20, saturated albumen solution 1–1·5; the starch is moistened with the water, the ichthyol carefully incorporated and lastly the albumen solution added. The last addition is made to prevent the deposition of the starch.

Ichthyol with carbolic acid: Ichthyol 25, carbolic acid 2·5, starch 50, water 22·5; the first two ingredients are dissolved in the water with the aid of a gentle heat, allowed to cool and the starch incorporated.—*Pharm. Centralhalle*, 1891, 70.

Hungarian Opium.—Dr. A. Deir obtained (by the method of Terier and Flückiger) from 340 capsules sixteen grams opium (dried over H_2SO_4); it appeared as a light-brown, brittle mass, resembling lactucarium, of much stronger odor than the Asiatic opium. A qualitative examination after Dragendorff revealed the presence of morphine, narcotine, codeine, narceine, thebaine and meconic acid; meconine was not found. Water extracted 66·64 per cent.; the morphine, by Flückiger-Squibb's process, equalled 16·24 per cent.—*Rundschau*, 1891, 67.

To remove paint and varnishes, which resist the action of strong lye, Dr. Stockmeier recommends a mixture of water of ammonia, two parts, and turpentine, one part; this applied to the surface to be cleaned will, after a few minutes' action, enable the paint to be removed by use of cotton waste or similar material.—(*Bayr. Gen. Ztg.*), Rundschau, 1891, 72.

Reaction of cocaine hydrochlorate.—This alkaloidal salt, if mixed with a small quantity of calomel and then moistened with water or simply breathed upon, gives rise to a blackening of the mixture. This property is noticeable also under some conditions with pure atropine; in this case heat is necessary, or a mixture of alcohol and water to produce the blackening; cold water or breathing upon such a mixture will not develop the coloration. The alkaloid cocaine does not give this test, but only its hydrochlorate.—E. Schell (*Els.-Lothr. Journ. d. Pharm.*), *Pharm. Ztg.*, 1891, 55.

The detection of resin in beeswax is best effected by E. Schmidt's modification of Donath's test: 5 grams of the wax are heated for one minute to the boiling point with 4–5 times its

weight of crude nitric acid, an equal volume of water is then added and the mixture supersaturated with ammonia; if the liquid be now poured off from the separated wax it should, if the wax was pure, have only a yellow color; but if the wax contained as little as one per cent. of resin, the liquid will be of a red-brown color, due to the formation of nitro-derivatives of the resin-constituents.—Dr. H. Röttger, *Chemiker Ztg.*, 1891, 45.

The red coloration of carbolic acid has been the subject of a very elaborate investigation by E. Fabini, the results of which are that the coloration is due to the action of hydrogen peroxide upon metal containing carbolic acid in presence of ammonia; H_2O_2, metal and NH_3 *must be present* to produce the color. The quantity of metal necessary is very small, one part of Cu or Fe in 180,000 is sufficient for the red coloration, while one part of Cu or Fe in 300,000 or one part Pb in 65,000 is sufficient to show change in the acid; of NH_3 one part in 10,000 will be quite sufficient. The appearance of the color is explained by the formation of ammonium phenylate (by absorption of NH_3 from the air), which, with the metallic salt present in the carbolic acid, forms a metal-phenylate, which in turn is acted upon by H_2O_2 producing the coloring principle and liberating the metal. Copper sulphate with ammonium phenylate gives a green precipitate of cupric phenylate; the latter, upon the addition of H_2O_2, produces at once (with effervescence) the red coloring matter. This is soluble in alcohol reprecipitated upon addition of water, upon drying forming a black, brittle substance which has the property of coloring carbolic acid; 1 : 300,000 will still impart a faint red color. The coloring matter is *entirely* organic, being absolutely free from metal, is volatile, and colored blue by concentrated H_2SO_4.

The action of metals upon the formation of the red color can be illustrated by the following experiment: ·10 cc. liquefied carbolic acid are placed in a test tube, ½ drop ammonia, a few drops H_2O_2 solution added and the mixture gently warmed. If the acid is free from metals, no coloration is produced; if now a bright knife blade be introduced into the mixture, blood-red streaks will flow from it after a very short time.

The occasionally noticeable, sudden coloration of carbolic acid is ascribed to elevated temperatures—this favoring the action previously explained.—*Pharm. Post*, 1891, 2, 25, 41 and 61.

The volatile oil of mustard.—In the AMER. JOUR. OF PHARM., 1888, 556, the presence of carbon disulphide in unadulterated oil of mustard was noticed. Recently Paul Birkenwald proved that the action of acid potassium sulphate (one of the decomposition products of myronate of potassium) upon the oil will produce CS_2; also that if the seed be distilled with steam under pressure, decomposition of the oil may take place with formation of CS_2.

The yellowish brown flocculent precipitate that forms in the oil, especially upon exposure to light or air gave the following analytical results I, compared with those from pure oil II:

	C.	H.	N.	S.	O.
I.	44·28	5·67	13·09	21·74	15·22 (by difference)
II.	48·49	5·05	14·14	32·32	

Comparing these results it would seem that the oxidation of the oil is accompanied by the separation of carbon and sulphur, probably as CS_2.

If in the distillation of oil of mustard a copper condensing-worm be used, there is often deposited a compound of copper, which after washing with alcohol approximates the formula Cu_2S,C_3H_5CNS, a combination of the oil with cuprous sulphide.

Myronate of potassium, $C_{10}H_{18}KNS_2O_{10}$ in its decomposition by ferments, breaks up without uniting with elements of water; while all other glucosides unite with water under the condition named. The author, however, found that, while myronate of potassium dried over H_2SO_4 agreed to the above formula, by heating it carefully to temperatures not exceeding 100° C., almost enough water was lost to equal one molecule, and it is, therefore, probable that the formula of the anhydrous myronate of potassium is $C_{10}H_{16}KNS_2O_9$, and that in its decomposition H_2O is necessary as in the case of all other glucosides. This would make the rule absolute that H_2O is essential to the decomposition of all glucosides.—*Pharm. Ztschr. f. Russl.*, 1890, 737, etc.

GRANULAR EFFERVESCENT POWDERS.[1]

BY HEDLEY PATTINSON.

Let us look at the theory of granulation first. It is the citric acid in the mixed powder which is the chief factor in the process of granulation, assisted to a small extent by the moisture in the sugar.

[1] From a paper read before the Chemists' Assistants' Association, Newcastle-on-Tyne; *Phar. Jour. and Trans.*, February 7, 1891, p. 712.

A glance at the formula ($H_3C_6H_5O_7 \cdot H_2O$) will show that water is present. This is given off in heating, and the moisture thus obtained partially forms a syrup with the sugar, which acts as an adhesive agent during the melting process. The object aimed at is to apply only sufficient heat to cause adhesion and at the same time to lose as little CO_2 as possible during the process. Care must also be taken not to raise the temperature too high, as the preparation would then be rendered much less freely soluble. Before looking on the different methods of granulation I would say that effervescent preparations in this form are gaining popularity year by year. In a pleasant draught an unpalatable drug may be taken, its nauseousness being corrected by that pleasant, sharp taste due to the presence and escape of carbonic acid gas. The popularity of such preparations as gran. effervescent antipyrin, citrate of caffeine, lithia, sulphate of soda, etc., is in itself sufficient proof that they are preferred to the ancient manner of a pill, powder or bitter draught. Again, when taking a dose of caffeine, for example, the effervescing draught in itself acts, and independent of the presence of the active ingredient, produces a soothing and good effect upon the patient.

Three methods of granulation have been advocated. (1) To make the mass into a tough paste with S.V.R., press the mass through a large meshed sieve and dry quickly. (2) To heat the dried ingredients together until a temperature between 200° and 220° F. is reached, stirring well all the while to form granules; then by means of suitable sieves separating the granules and preserving in well-closed bottles. The foregoing, as will be perceived, is the pharmacopœial method. To both of these processes experience shows there are objections. The objections to the first may be readily seen, inasmuch as it is an expensive and comparatively poor method. In the official process I have found a large amount of waste, as it is impossible to get all the base and active ingredients into granular form, the large proportion of powdery product mixed with the granules giving the preparation an inelegant and "saline" appearance. To follow the directions of the B.P., the granules of perfect form are to be separated from the powdery product. But is it not possible that the active ingredient—or a large percentage of it—may be contained in this part of the preparation?

The process, I venture to say, which beats the two foregoing, is that of heating quickly, with manipulation, the ingredients till the

mass becomes pasty. This pasty portion is lifted up, at intervals of a few seconds, to the top so as to allow all the powder to come into contact with the bottom of the granulating tin used. It is then pressed through a wire sieve of convenient sized mesh. The granules are received on white paper and dried in a warm room on suitable trays. By this method we have no S.V.R. used, neither have we a superabundance of powder mixed with our granules. Care, of course, must be taken to apply a certain amount of heat to prevent too great a loss of CO_2, otherwise our product would be deficient in effervescence. A little experience in manipulation is soon obtained and as much as 50 per cent. of active ingredients can readily be incorporated. The B.P. sodii tart. effervesc. may be taken as a typical example of the medicaments. I need not go over the details of manufacture again, but will compare it with that popular article which seems to be sold cheaper and of more inferior quality year by year. I refer to what is known as citrate of magnesia.

Magnesia in this preparation is frequently entirely absent, and such phrases as "so-called" or "known to the public as," sometimes omitted altogether from the labels. The same may be bought of grocers, etc., outside of pharmacy, nicely flavored with lemon, vanilla, etc., in divers colors. As an example of what pleases the public, the following is the composition of a preparation boldly styled citrate of magnesia:

Acid. tartaric.,	37 parts.
Sodii bicarb.,	41½ parts.
Sugar,	21 parts.
Magnes. sulph. exsic.,	½ part.

The above compound, sold under the name of citrate of magnesia, was not even in granular form, but retailed under that name and sold in the simple form of a saline. In the words of one of our weekly journals, "Never use good stuff and remain careless of details in the struggle for existence."

Two prosecutions occurred about a year ago in reference to granular effervescent citrate of magnesia, the special adulteration being lead to the extent of ·37 grain per pound. Scientific evidence having been given to the effect that commercial citric acid invariably contained a minute quantity of lead, the stipendiary on consideration dismissed the case, but without allowing costs.

In the same year a chemist in Greenock was prosecuted under

the '72 Adulteration Act for selling as magnes. cit. an article alleged to be adulterated with sodæ carb., ac. tart., sugar, and sodæ sulph. Again, evidence was given for the defence to the effect that the substance sold was what is known and sold in commerce as magnes. citrate. Medical evidence was also given to the effect that when a medical man prescribed magnes. cit. he meant the article as sold by defendant, simply an effervescing salt, chiefly for the tartrate of soda found during effervescence. The authorities in this case also dismissed the case. Since then the advance made in the manufacture of effervescent preparations has been indeed rapid, and the past year has the distinction of adding to the official list four new effervescent salts, three of them granular. (See this JOURNAL, January, pp. 14, 15.)

THE MELTING-POINT OF PARALDEHYDE.

BY P. W. SQUIRE.

Paraldehyde, like oil of anise and many other liquids, may be cooled without agitation to a temperature far below its real freezing-point, and then may suddenly set into a solid mass, the temperature at the same time rising to the melting-point of the crystals, providing that the reduction of temperature has not been carried so far that the heat evolved during solidification is insufficient to raise the mass to its initial melting-point. If, however, the liquid be stirred while it is cooling, or a paraldehyde crystal be dropped into the liquid while just at its crystallizing-point, then the freezing-point of the liquid and the melting-point of the crystals will almost coincide.

The melting-point of "absolute" paraldehyde does not seem to have been determined with any degree of certainty, as the generally accepted figure, 51° F. (10·5° C.), is too low. The melting-point of the crystals obtainable from various samples appears to be modified by the presence of impurities in the liquid from which they are crystallized. Two years ago the best commercial sample examined in our laboratory began to crystallize at 50° F., but was not wholly solid above 48°, this latter being also the temperature to which the thermometer suddenly rose after the liquid had been cooled below its freezing-point and then stirred. Several other samples showed no sign of solidification above 44° F., and obviously contained both aldehyde and acid. We find now that paraldehyde from the same

source as the sample first mentioned gives a still higher melting-point than before. The bulk solidifies at 52° F., and, by separating the crystals which first form, it is comparatively easy to obtain a fraction with a melting-point of 53° F. This is the highest figure yet noticed; and even now we do not know that this is "paraldehyde absolute." By systematic fractional crystallization of a large quantity of material, a still higher melting-point might be obtained.

As the solid polymer "metaldehyde" is almost insoluble in paraldehyde (except while heated), it is probable that the higher the melting-point the purer the compound; but any sample which passes the other tests, and conforms to the B. P. standard of "beginning to congeal at 10° C." ("with agitation" being understood), should be sufficiently pure for all practical purposes.—*The Chemist and Druggist*, 1890, p. 852.

COMBINATION OF CAMPHOR WITH PHENOLS.[1]

BY E. LÉGER.

Camphor and the phenol are melted together in the calculated proportions in closed vessels. Under these conditions, compounds are formed which decompose easily under the influence of heat, or when treated with solvents or with alkalies. That definite compounds are formed is, however, shown by the fact that the liquid products contain their constituents in molecular proportions, and that in those cases where they crystallize the composition of the first crystals is the same as that of the last. The addition of phenols to alcoholic solutions of camphor reduces the rotatory power of the latter to one-half. The compositions of the various products were determined by means of the polarimeter, and the method will be described in detail subsequently.

Phenol monocamphoride, $C_6H_6O,C_{10}H_{16}O$, is a colorless liquid, which crystallizes only at about — 23°; sp. gr. at about 0° = 1·0205; $[\alpha]_D = + 20°$. *Phenol hemicamphoride*, $2C_6H_6O,C_{10}H_{16}O$, a colorless liquid which does not solidify at — 50°; sp. gr. at 0° = 1·040; $[\alpha]_D = + 10·5°$. It combines with camphor to form the monocamphoride; if mixed with excess of phenol, the latter dissolves,

[1] *Compt. rend.*, 111, 109-111; reprinted from *Jour. Chem. Soc.*, December, 1890, p. 1427.

but when the liquid is cooled to — 25°, it separates distinctly into phenol hemicamphoride and phenol. *Resorcinol monocamphoride*, $C_6H_6O_2,C_{10}H_{16}O$, forms large, thin, hygroscopic, rectangular lamellæ, which become liquid when mixed with a small quantity of water, and are decomposed by a large quantity with separation of camphor. It melts at about 29°, but can remain for a long time in superfusion at 15°; rotatory power in alcoholic solution, $[\alpha]_D = + 22{\cdot}5°$. *Resorcinol dicamphoride*, a syrupy, colorless liquid, which forms large, hexagonal crystals at 0°; sp. gr. at 15° = 1·0366; $[\alpha]_D = + 25{\cdot}9°$. *α-Naphthol camphoride*, $C_{10}H_8O,C_{10}H_{16}O$, is a slightly colored, syrupy liquid, which does not solidify at — 16°, and is not decomposed by water; sp. gr. at 0° = 1·0327; $[\alpha]_D = + 10{\cdot}5°$. It dissolves α-naphthol, which separates in short, rhombic prisms (Wyrouboff). *β-Naphthol camphoride*, $3C_{10}H_8O,5C_{10}H_{16}O$, a liquid very similar to the preceding compound, sp. gr. at 0° = 1·0396; $[\alpha]_D = + 22{\cdot}5°$. It dissolves β-naphthol, which separates from it in somewhat large, tabular crystals. *Salicylic camphoride*, $C_7H_6O_3$, $2C_{10}H_{16}O$, a white, nacreous mass of long, thin, microscopic needles, which melts at about 0°, and is only partially decomposed even by boiling water. Its rotatory power in alcoholic solution is $[\alpha]_D = + 27{\cdot}3°$.

Salol seems to form a similar compound, but its composition has not yet been determined. Salol crystallizes from salol camphoride in bulky, irregular crystals of the rhombic system, and some measurements of these by Wyrouboff are given.

OXIDATION OF ECGONINE.[1]

By C. Liebermann.

It has been shown by Einhorn that when anhydroecgonine is heated with hydrochloric acid it yields tropidine; it seemed probable, therefore, that ecgonine and tropine would give the same oxidation products under the same conditions, an assumption which is shown to be correct by the author's experiments.

When ecgonine (100 grams) is oxidized with chromic acid and sulphuric acid in the manner described by Merling (*Annalen*, 216, 329), a brown, syrupy acid is obtained; on boiling this product with alcohol, there remains a considerable quantity (about 18 grams) of tropinic acid, identical with the compound obtained by Merling by

[1] *Ber.* 23, 2518; reprinted from *Jour. Chem. Soc.*, December 1890, p. 1449.

the oxidation of tropine, and the alcoholic filtrate, on evaporation, yields a brown, semi-crystalline mass, from which an acid of the composition $C_7H_{11}NO_3$ can be isolated without difficulty.

Tropinic acid, $C_8H_{13}NO_4$, melts at 253° with decomposition (Merling gives 220–240° as the melting-point), and is very readily soluble in water, but very sparingly in alcohol, and insoluble in ether and benzene; it decomposes carbonates, and seems to be a monocarboxylic acid. The *barium* salt, $(C_8H_{12}NO_4)_2Ba$, and the *calcium* salt $(C_8H_{12}NO_4)_2Ca$, are very hygroscopic; the *zinc* salt crystallizes in colorless needles, and the *lead* salt is soluble in water. The *silver* salt is very readily soluble in water, and is unstable. Tropinic acid is immediately oxidized by potassium permanganate, even in the cold. The *hydrochloride*, $C_8H_{13}NO_4,HCl + H_2O$, is crystalline, and melts below 100° with decomposition; the *aurochloride*, $C_8H_{13}NO_4,HAuCl_4$, crystallizes in golden prisms, and the *platinochloride* is very readily soluble. The formation of tropinic acid from ecgonine affords fresh evidence of the close relationship existing between ecgonine and tropine.

The acid, of the composition $C_7H_{11}NO_3$, referred to above, separates from water or alcohol in well-defined crystals, melts at 117–118°, and is readily soluble in alcohol; it decomposes carbonates and forms soluble salts, but it does not reduce potassium permanganate like tropinic acid. The *silver* salt, $C_7H_{10}NO_3Ag$, is very readily soluble in water. The *calcium* salt, $(C_7H_{10}NO_3)_2Ca$, and the *barium* salt, $(C_7H_{10}NO_3)_2Ba$, crystallize in needles. The *hydrochloride* is a crystalline, deliquescent compound. About 14 grams of this substance are obtained by the oxidation of 100 grams of ecgonine.

TEST FOR THE DETECTION OF SESAME OIL IN OLIVE OIL.[1]

By J. F. Tocher, A.I.C.

I had occasion a short time ago to examine some oils, and while so engaged I failed to find a published reliable test for the detection of sesame oil in smaller quantities than 10 to 25 per cent. The U.S.P. test is not reliable below 20 per cent., and serves principally as a distinctive test between sesame and olive oils. Considering the liability of olive oil being readily adulterated with sesame oil, I

[1] Read January 14, at the evening meeting of the Pharmaceutical Society, in Edinburgh; reprinted from *Pharm. Jour. and Trans.*, Jan. 24, p. 638.

applied myself to the task of obtaining a more satisfactory test for the latter. I have been successful in finding one, which, although it cannot rank with the silver test for cotton seed oil, still enables one to detect with rapidity and ease 5 per cent. of adulteration, while 1 per cent. can be detected by exercising a little care in the manipulation. I found that the acetic acid extract from sesame oil, which I was examining for another purpose, mentioned in my next note, turned blue or bluish-purple when boiled with HCl, in which a few grains of pyrogallol had been dissolved. The same experiment was tried with sesame oil itself, using equal parts of the pyrogallol solution with the oil, with the result that the pyrogallol solution turned purple. I treated olive oil in a similar manner and found it to give only a faint yellow coloration. Almond, rape and ground nut oils gave no color, while sunflower oil turned the solution a very faint blue, and cotton seed oil imparted a very light red. It now occurred to me that this behavior of sesame oil with HCl solution of pyrogallol might be utilized for its detection in olive oil. Accordingly solutions of sesame oil in olive oil of various percentage were prepared and the test applied. The following are the results obtained upon treating olive, sesame and other oils with hydrochloric acid solution of pyrogallol and boiling:

Pure Olive: faint yellow.	Almond: colorless.
Sesame: deep purple.	Ground Nut: colorless.
20 p. c. Sesame: purple.	Cotton Seed: very faint red.
10 p. c. Sesame: purple.	Sunflower: faint olive.
5 p. c. Sesame: faint purple.	Rape: colorless.
1 p. c. Sesame: very faint purple.	Oleic Acid: faint red.

I obtained the best results by applying the test as follows, viz: Prepare a solution of pyrogallol in pure hydrochloric acid (ʒss. to ʒj.). Measure half an ounce of this solution into a wide-mouthed test-tube provided with a cork, and add half an ounce (an ounce if the proportion of sesame oil be small) of the oil to be tested. Shake vigorously and then set aside for about a minute to allow the oil and acid to separate. Draw off the supernatant liquid by means of a pipette, and boil the hydrochloric acid solution for about five minutes, when, if sesame oil be present, the color of the solution will have changed to purple. The color does not appear at once, but develops on boiling for a short time. When viewed by transmitted light the color is wine red to purple, and by reflected light it

is blue, which is best observed by pouring the solution into a small porcelain basin. When the purple solution is allowed to stand for some time a small purple deposit takes place. It has not yet been examined, but it has the appearance of a dye. It would be interesting to determine what this substance is, because the pyrogallol reaction with sesame oil points probably to the presence of still another constituent in the oil other than the one I am now about to describe.

ISOLATION OF ANOTHER SUBSTANCE FROM SESAME OIL.

By J. F. Tocher, A.I.C.

In the "Pharmacographia" it is stated that "sesame oil contains an extremely small quantity of a substance, perhaps resinoid, which has not yet been isolated. It may be obtained in solution by repeatedly shaking five volumes of the oil with one of glacial acetic acid. If a cold mixture of equal weights of sulphuric and nitric acids be added in like volume, the acetic solution acquires a greenish-yellow hue. * * * The oil itself being gently shaken with nitro-sulphuric acid takes a fine green hue, as shown by Behrens in 1852, who pointed out that no other oil gave the same reaction. * * *" I have made an examination of this extractive from sesame oil, having had three objects in view, viz:

(1) To find, if possible, a reaction more delicate than that given in the "Pharmacographia," which would suit as a test for the detection of sesame oil. (2) To ascertain whether the reaction caused by nitro-sulphuric acid was due to a constituent in the extractive, as implied in the "Pharmacographia." (3) To separate the resinoid substance said to be present.

How far success has followed me in the first-mentioned can be judged by those who apply the test described in my former note. Regarding the second an affirmative reply has to be given, for when a little of the extractive was brought in contact with $H_2SO_4 + HNO_3$ on a porcelain slab, the acid mixture acquired a fine green color, changing to a bright red. The third and principal object, the examination of the extractive for the purpose of separating the resinoid substance, was one in which I entered by no means sure of success, but the following will indicate to what extent the object has been attained.

Flückiger and Hanbury state that five volumes of oil should be taken with one volume of glacial acetic acid to obtain the solution giving the reaction with nitro-sulphuric acid. I found that if I desired to obtain a reasonable quantity to experiment upon, five to one was not the proportion to use. I therefore measured out ten volumes of oil and seven volumes of acid, and shook vigorously from time to time, and then set aside for the acid to separate. The acid was then drawn off into a porcelain basin and placed over a water-bath, in order to drive the acid completely off. The residue was gelatinous, transparent and amber-brown in color. It was at this stage that the pyrogallol reaction, formerly described, was obtained. A small quantity of the gelatinous extract was now treated with diluted potash and warmed. No result was obtained by doing so, but when the solution was vigorously shaken and then allowed to stand for some time, it was found that a white deposit had taken place. In the meantime, I had found that the extract was partially soluble in hot alcohol, and that when diluted with distilled water, a deposit also took place there. A little of this deposit was placed under the microscope, when small crystalline needles were observed, which served to indicate the probability of the separation of the constituent I was in search of.

The amount was so small that no examination could be made, and there being no evidence against the supposition that the crystals might simply be those of myristic, palmitic and other known acids contained in sesame oil, I again concentrated my attention on the deposit obtained by saponifying the extract. The remainder of the gelatinous extract was therefore treated with warm dilute potash, shaken from time to time vigorously and set aside for twelve hours in a conical test glass, in order to collect the deposit. The supernatant fluid was siphoned off and the deposit washed several times with distilled water. It was now boiled in dilute HCl, collected on a filter, washed until the washing ceased to give an acid reaction and then dried in a water oven. The substance was found to be soluble in alcohol. It was therefore dissolved in hot alcohol and set aside to crystallize. Long crystalline needles were formed in the course of a few hours which, when collected, washed and dried, melted at 116–118° C. Subsequent recrystallization was resorted to, in order to ascertain whether the melting-point was constant. The substance again melted at 117–118° C. It was found to be soluble

in benzine, turpentine, carbon disulphide, and, of course, alcohol and glacial acetic acid, very soluble in chloroform, insoluble in water and alkalies and also hydrochloric acid, and decomposed by sulphuric and nitric acids. It was quite neutral to litmus and other indicators. It gave no reaction with HCl solution of pyrogallol, proving that it was not the cause of the purple color which formed the base of the new test. Nitro-sulphuric acid, however, gave a green and then bright red color, similar to that obtained on treating the gelatinous extract with the same reagent, and corresponding to the U.S P. test for sesame oil. On treating the alkaline liquor from which the substance had deposited with HCl solution of pyrogallol, the purple color was at once obtained. The new substance may therefore be considered as the cause of the color described in the U.S.P., but not of pyrogallol coloration. The gelatinous extract would appear from the foregoing to be a mixture of substances and not a simple resinoid body, as one would infer from the "Pharmacographia." In fact, the great proportion of the extract is simply oil, the substance which I have been able to separate forming a very small proportion, indeed.

The following is a comparison in a tabulated form between the properties of the new substance and those of oleic acid:

With nitro-sulphuric acid: New substance green, then bright red; oleic acid, brownish.
With nitric acid: New substance, green, then yellow.
With pyrogallol solution: New substance, no reaction; oleic acid, faint red.
With sugar and sulphuric acid: New substance, brownish; oleic acid, brown, afterwards bright violet.

Neither stearic, palmitic or myristic acids gave any definite color with the foregoing reagents. It will be observed that oleic acid is mentioned as giving a violet color with sulphuric acid and sugar, which fact I have not yet seen stated. It is very charcteristic of oleic acid.

With the collection of facts I have here recorded, I now turned my attention to what the percentage composition, and from that the formula, of the substance might be. I therefore proceeded to prepare more of the substance, in order to perform a combustion. Half a gallon of the oil was used in the extraction of the substance and from that I obtained a yield of crystals equivalent to ·04 per cent.

The method employed was that formerly described, and I may

here state certain precautions which I found it necessary to take in order to obtain crystals of a constant melting-point. The acetic acid extract may be said to be satisfactory when it is firm, gelatinous and dark brown. If the extract is liquid, too much glacial acetic acid has been used. It may be mentioned in passing, however, that the extracts from cotton seed and olive oils are liquid and yellow in color. Regarding the precautions to be taken after the deposit has been collected, it was found that after treating with HCl, washing and drying, an oily stain had been imparted to the filter paper, indicating the presence of oleic or other acids, as the substance does not melt at the boiling-point of water. In that case, the substance had to be repeatedly treated with KHO, etc., in order to remove the last trace of foreign matter, and less trouble was experienced in crystallizing.

The combustions were performed in the usual way with CuO, using a filter pump as an aspirator at the close of the operations, taking the precaution, of course, of inserting an apparatus for drying, etc., the air previous to being used. The following are the results:

No. 1. Amount of substance taken, ·2483 gram. Result, ·2781 gram CO_2 = ·0758 C. ·1239 H_2O = ·0137 H. No. 2. Amount taken, ·1851 gram. Result, ·2028 gram CO_2 = 0555 C. ·0890 gram H_2O = 0099 H. No. 3. Amount taken, ·2065 gram. Result, ·2355 gram CO_2 = ·0642 C, and ·1010 gram H_2O = ·0112 gram H. The following, therefore, are the percentages found:

	I.	*II.*	*III.*	*Mean.*
C,	30·50	30·02	31·08	30·53
H,	5·54	5·35	5·42	5·43
O (by diff.),	63·96	64·63	63·50	64·04
	100·00	100·00	100.00	100·00

The hydrogen has been pretty constant, but the carbon rather variable (maximum has been 1 per cent.), but the results are constant enough to warrant one in saying that the substance does not correspond to any known constituent in sesame oil. To arrive at its formula, it only remained for me now to determine the molecular weight of the substance, which I tried by one method, but owing to the small quantity remaining at my command, I did not obtain concordant results. Time has also been against me, having only had five days at my disposal after the completion of the above experiments, that time being quite inadequate to commence anew to pre-

pare another crop of crystals. I had pledged myself, moreover, to give these short communications at this meeting, and have endeavored to do so, incomplete as one of them is, promising that should success attend further experiments to give the results at a future meeting.—*Phar. Jour. and Trans.*, Jan. 24.

ANALYSIS OF PEPTONES[1]

By A. Denayer.

The author considers the method of precipitating the albumose-peptone, as recommended by G. Bruylants, inaccurate, since mucilage is precipitated by ammonium sulphate solution. He recommends the following method for the complete analysis of peptones: *Mucilage:* 1–2 grams of peptone is treated with water and precipitated with Mayer's potassium mercury iodide solution (49·801 grams potassium iodide, 13·546 grams mercuric chloride, 1,000 cc. water), filtered, washed, concentrated to a few cc., saturated solution of ammonium sulphate added, and the mixture heated to boiling, whereby the mucilage is precipitated. The precipitate is washed by decantation, then with ammonium sulphate, and, lastly, rapidly with cold water; the double iodide is separated with boiling alcohol, and the mucilage, with adhering ammonium sulphate, is weighed. The ammonium sulphate is determined, and its weight deducted. *Albumose-peptone:* 1–2 grams of peptone is treated with 5 cc. of water, the mucilage and albumose precipitated with ammonium sulphate, and the precipitate weighed, from which is deducted the weight of mucilage and ammonium sulphate. *Peptone:* 1–2 grams of substance is dried in a vacuum at 60°, whereby the substance swells up, and is then washed with 95 per cent. alcohol. The residue is dissolved in a few cc. of water, and an excess of sodium phosphotungstate added. The precipitate, consisting of mucilage, albumose and peptone, is weighed on a tared filter. It is then incinerated, and the weight of the ash, as also the weights of the mucilage and albumose, deducted from that of the whole precipitate, the difference being peptone. *Unchanged substances*, consisting of amido-bases, fatty acids, and amido-acids, are determined in the alcoholic extract. Taurine, dextrose and gly-

[1] *Chem. Centr.*, 1890, i, 1084; from *Revue Internal. Scientif.*, 3, 168; *Jour. Chem. Soc.*, 1890, p. 1351.

cogen are insoluble in alcohol, and are determined by the difference between the determined substances and 100. The water, mineral matters, and insoluble substances are determined according to Bruylants' method (*loc. cit.*). The author adds the following analyses:

	Peptone from albumin of cleaned meat.	Peptone from egg-albumin.	Peptone prepared directly from meat.
Peptone,	37·675	34·700	25·857
Albumose,	31·300	53·350	15·964
Mucilage,	—	—	9·826
Unchanged products,	5·525	5·930	29·972
Mineral matters,	8·285	1·025	19·386
Water,	10·250	4·625	—
Insoluble,	9·965	3·980	—

NEW REACTIONS OF ALBUMINS.[1]

By C. Reichl.

The author has previously (1889) called attention to the color reactions obtained by treating the albuminoïds with alcoholic benzaldehyde or salicylaldehyde in presence of dilute sulphuric acid and ferric sulphate, and has now elaborated his previous experiments and extended them to other aromatic aldehydes.

Reaction with Benzaldehyde.—The blue condensation-product obtained on mixing egg-albumin, benzaldehyde, dilute sulphuric acid, and ferric sulphate, gives an absorption-band in the spectrum near D; apparently it is a compound of a base with sulphuric acid, for, on adding an alkali to the solution, the blue color disappears with formation of a brownish-white precipitate, which dissolves in acids, again forming a blue or bluish-green solution. The precipitate dissolves in alkalies, yielding a yellow solution. The ferric sulphate plays the part of an oxidizing agent, since dilute nitric acid, mercuric oxide, and other substances which readily part with their oxygen, may be substituted for it. This reaction of albumin appears to be due to the scatole-group contained in it, since scatole itself gives a bluish violet coloration when similarly treated.

Reaction with Salicylaldehyde.—When the solid albuminoïd is moistened with a 0·5 per cent. alcoholic solution of salicylaldehyde,

[1] *Monatsh.*, 11, 155–165; *Jour. Chem. Soc.*, 1890, p. 1350.

the alcohol allowed to evaporate, and the substance treated with a little dilute sulphuric acid containing ferric sulphate, colored products are formed. Egg-albumin and blood-albumin, blood-fibrin, and caseïn give a bluish-violet; legumin, a brownish-violet; vegetable fibrin, a brownish-yellow; and sheep's-wool and skin, violet-blue compounds. After some time, the solid mass dissolves, forming a solution having the same color. The bluish-violet solution obtained from egg-albumin shows an absorption-band in the spectrum between C and D, and contains a base which may be precipitated by alkalies. In order to recognize albumin in solution by this test, the liquid is mixed with a drop of the alcoholic solution of the aldehyde, an equal volume of concentrated sulphuric acid added, cooled, without shaking, and finally a few drops of ferric sulphate are poured in. According to the strength of the solution, a blue or violet zone is sooner or later formed. Salicylaldehyde gives a similar blue or violet solution when treated with scatole. The oil from *Spiræa ulmaria* gives the same reactions with the albuminoids as salicylaldehyde, but the color is not so intense.

Reaction with Anisaldehyde.—Egg-albumin, vegetable-albumin and caseïn give a violet coloration; blood-albumin and sheep's wool, a violet-red; blood-fibrin, a blue; legumin, a brownish-violet coloration. The violet solution from egg-albumin gives an absorption-band between D and F. Alkalies precipitate a base which is apparently a scatole compound.

Reaction with Vanillin, Piperonal, Cinnamaldehyde and Furfuraldehyde.—All these substances give colored products with the albuminoïds and similarly colored products with scatole.

The aromatic aldehydes, in presence of sulphuric acid and ferric sulphate, give colored condensation-products with phenols, but these have an acid character, and unite with bases to form new colored compounds. It consequently follows that in albumin it is the scatole-group which furnishes the colored compounds above described. The production of these substances forms not only a very delicate test for albumin, but may be used conversely as a test for the presence of aldehydic compounds in wood, in resins, and in ethereal oils.

Injections of ichthyol have been found of value in the treatment of gonorrhœa and gonorrhœal cystitis. Dr. Köster (*Wiener Med. Presse*, Novbr., 1890) has used a one-per-cent. solution of the ammonium compound for the purpose stated, giving the injection two or three times daily.

MUSK.[1]

A recent French official report furnishes some interesting information with regard to the exact habitat of the musk deer and of the trade routes by which the valuable drug is brought into commerce. According to this authority the musk known in the European markets as "Tonquin" would be more correctly described as "Yunnan" musk, since its geographical origin is not the French territory of Tonquin, but the province of Yunnan, in the extreme south of the Chinese Empire. When it finally succumbs to the commercial spirit of the West, there is every prospect that the centre of the musk trade may be shifted from Shanghai to Calcutta, Rangoon or Hanoi, or that these three centres may divide the business between them. At present, however, the musk of Yunnan is nearly all brought by a long and difficult overland route to Shanghai, the commercial centre of the drug. As the crow flies, Shanghai is 1,400 miles distant from the western parts of Yunnan, where the best musk is collected; Hanoi, in French Tonquin, is only about 400 miles off, and is easily accessible by the Red River route, while to Rangoon there are about 750 miles to travel in a straight line, and to Calcutta 1,000 miles. Yunnan musk, the report says, has been brought into commerce by the present trade route ever since the commencement of the sixteenth century, the chief places of collection in Yunnan being known as Ta-li, Yao-chow and Mien-ning—all in the western part of the province. That portion of Yunnan is exceedingly mountainous, and in it the musk deer are still found in comparatively large numbers, in spite of the energetic manner in which the creatures are pursued by the musk-hunters.

A few years ago persistent reports were circulated in our markets that the Chinese Government had strictly enjoined a prolonged close season for the musk deer, and musk prices advanced partially upon the strength of those rumors; but it is doubtful whether such an order, even if it were issued, could have been effectively enforced. Yunnan, we may here observe, is one of the principal Chinese opium-growing provinces, and, according to European travellers who have traversed these parts, vast fields of poppy are cultivated everywhere, in spite of the stringent regulations issued by the Central Government altogether forbidding the cultivation of the drug in

[1] Abstract from *The Chemist and Druggist*, Nov. 22, 1890, p. 716.

China. If, then, opium-growing is suffered with impunity, it is not likely that any regulations would seriously avail against the hunting of the musk deer. Besides Yunnan, the provinces of Sse-chuan and Kwei-chow also produce musk; but the product of these two provinces is said to be of a very inferior quality, and the Chinese themselves, who consume musk for many more purposes than the Europeans, will have none of it. According to Mr. Hosie, in his work on Western China, the musk deer is rather plentiful in Sse-chuan; and other writers also assign to the animal a rather more extensive habitat than does the French writer. The only other musk besides that of Yunnan, says the latter, used by the Chinese themselves is musk from Thibet, known in Europe as cabardine musk.

Two distinct varieties of cabardine musk are known in European trade, viz: the so-called China cabardine, and the Russian cabardine, which reaches London by way of Siberia. It is probably to the former and more valuable variety that the writer refers, as the Russian cabardine musk is collected much farther north. The quantity of musk which the deer (known to the Chinese by the name of Tshan Tse) furnishes, varies according to its age and the season when the musk is obtained. With somewhat superfluous simplicity, it is stated that "the operation of cutting off the musk-pouch is fatal to the animals;" and it is also affirmed that there is an idea that if the deer is killed before the operation the musk is lost. How this can be is not explained, though it would be interesting to know how the musk deer is induced to allow itself to be caught alive to submit to the operation. In the Chinese musk-hunt illustrations, moreover, which are found inclosed as advertisements in the Shanghai musk caddies, the animals are often represented as being killed by arrows shot from a distance, and this is evidence towards the supposition that the pods are not taken from live animals. The best musk is yielded by well-fed deer from five to six years old, and it should only be taken in the spring or summer, as at other seasons it is not in good condition.

From the three trade centres in Yunnan, which we have enumerated, the musk-pods are brought to Yunnanfu, the capital of the province, where they are bought up by merchants from the province or Kiang-si, who make a specialty of this article, and carry it to Shanghai and Canton, the two principal markets. Shanghai is by far the

most important centre, and the musk is brought thither by way of Chung-King and Ichang, on the Yang-tse River. Canton receives its modest quota by way of Pai-sse. In Yunnan already three grades of musk are distinguished in the market, the first (Ki-tan-ko) having locally ranged from 58*s.* to 62*s.* per oz. in value last year; the second (Pan-tsi-kwan-yu) from 52*s.* to 55*s.* 6*d.* per oz.; while the third consists of adulterated pods (Maoko), which have no fixed market value. In Shanghai there are three native houses who share the bulk of the musk trade between them, and who are believed to command a capital of about £25,000 each. Musk is liable to several small local duties on its way from Yunnan to Shanghai. In the first place, there is an entrance duty, amounting to about 2*d.* per oz., at the boundary of each prefecture or administrative district through which the musk is carried; but on these duties drawback is allowed if the musk is exported. Next there is the li-kin duty of 10*d.* per oz., which must be paid when the musk reaches Shanghai or Canton; and finally there is an export duty of about 2½*d.* per oz. levied by the Chinese maritime customs. Last year the value of musk exported from Shanghai to other Chinese ports was estimated at £12,000, and that of musk shipped from Shanghai to foreign countries at £56,400. From Canton £265 worth of musk was exported to Chinese ports, and £776 worth abroad. But Pekin, the Chinese capital, receives, in addition to this, about 600 caddies of musk every year for pharmaceutical purposes, the article being held in high repute among the Chinese as an antispasmodic, a cholera specific, and a remedy against sores and ulcers.

FERMENTATION AND COMPOSITION OF CRANBERRY JUICE.[1]

By E. Mach and K. Portele.

Cranberry juice was allowed to ferment with yeast for nine days, either without further addition or with addition of grape must, and the alcohol determined. The results show that the juice will not ferment, and that this is caused by a substance present in the juice, and not in the skin, etc., of the berries. Similar results were obtained when a mixture of cranberry juice and must (equal vols.)

[1] *Landw. Versuchs-Stat.*, 38, 69–78; reprinted from *Jour. Chem. Soc.*, December 1890, p. 1455.

was left to ferment; after 14 days, there was no sign of fermentation. With cranberry juice (1 part) and must (2 parts), fermentation began in 9 days, and in 14 days 3·88 per cent. of alcohol was formed. Löw (*J. pr. Chem.* [2], 19, 312) showed that cranberries contain benzoic acid, and pointed out that this might be the reason that they do not decay for so long, and the author's experiments confirm this view. Neither oxalic, succinic, tartaric, nor salicylic acid is present.

The sp. gr. of cranberry juice from Bozen and from Hall varied between 1·0521 and 1·0661.

The following numbers show the amounts of different constituents in grams per litre of juice of cranberries, examined in 1888, from (A) Bozen, and (B) Hall:

	Invert-sugar.	Total acid as malic acid.	Benzoic acid.	Tannic acid.	Nitrogen.	Ash.
A. Fresh berries—						
(*a*), 26th Sept., . . .	92·00	19·11	—	2·24	0·12	2·98
(*b*), 6th Oct., ...	79·20	18·04	0·862	—	0·11	—
Soft berries—						
(*c*), 13th Nov., . . .	118·00	19·92	—	—	—	—
B. (*d*), healthy, fresh, and hard, 14th Nov., . . .	90·20	18·84	0·638	—	0·101	—
(*e*), soft and dried up, 14th Nov., ...	116·70	20·55	—	—	—	—

Juice from (*d*), examined later (21st March, 1889) contained invert-sugar 73·80, total acid 22·33, volatile acid (as acetic acid) 3·25, alcohol 1·04, and ash 3 64 grams per litre. Juice from (*e*) contained, on 10th December, 1889, invert-sugar 41·10, acid 34·18, benzoic acid 0·759, volatile acid 15·20, and alcohol 3·42 grams per litre. The ash of (*a*) contained phosphoric acid 3·11, and potash 47·64 per cent.

Malic and citric acid may be present in considerable quantities.

Claassen found that the bitter substance present in cowberry leaves was identical with arbutin (AMER. JOUR. PHAR., 1885, 321); in a subsequent examination of American cranberries, he could not detect arbutin, but found a substance (oxycoccin) which gave similar reactions to arbutin (AMER. JOUR. PHAR, 1886, p. 321-325).

The fruit and leaves of *Arctostaphylos Uva ursi* do not contain benzoic acid. The arbutin which is present has no preservative action. Cranberry leaves contain no benzoic acid.

MINUTES OF THE PHARMACEUTICAL MEETING.

FEBRUARY 17, 1891.

On motion of Mr. McIntyre, Mr. W. B. Thompson was called to preside. The minutes of the last meeting were read, and no corrections having been asked for, they were approved.

The Proceedings of the American Pharmaceutical Association, whose last meeting was held at Old Point Comfort, Va., were presented to the college library by Prof. Maisch, the permanent Secretary. For this volume the college returned its thanks.

A paper upon the *Assay of Opium*, by Mr. W. T. Hankey, of the present senior class of our college, was read; its reading elicited remarks from different persons. Prof. Trimble said that the Pharmacopœia process does not exhaust the opium, that the process of Dr. Squibb does, but that the yield is always in excess, and it has been shown that this is due to the meconate of calcium, which contaminates the morphine; this, when treated as recommended by Mr. Hankey, gives a result that is satisfactory.

Mr. England read some *pharmaceutical notes*. Prof. Maisch asked why Mr. England preferred to make the *spirit of peppermint* in the way indicated, since filtering after maceration with the coarsely powdered leaves, as directed by the Pharmacopœia, obviated the difficulty arising from a waxy matter which renders the freshly-made spirit cloudy and will not filter out through paper alone. Crude pure oil, quite recently distilled, will dissolve clear in from 1 to 3 parts of alcohol of ·835, but an addition of more alcohol will usually cause a cloudiness; after careful rectification, oil of peppermint will yield clear solutions with alcohol in all proportions.

Mr. Beringer read a paper upon *Bimuriate of Quinine*, and in answer to an inquiry as to the strongest solution that could be made, replied that the best solution was one of 50 per cent. and useful for hypodermic use.

Mr. McIntyre, to whom had been referred the query relating to *Whitworth's liniment*, gave the following from Dick's Encyclopædia:

℞.

Oil of thyme,	4 drachms.
Tincture of myrrh,	2 ounces.
Tincture of camphor,	2 drachms.
Compound spirit of lavender,	2 ounces.
Alcohol,	8 ounces.

(All fluid measure.)

Mix.—25 drops, 2, 3 or 4 times a day.

Red Bottle, Whitworth's (from an old recipe book.)

Opium in powder,	120 grs.
White castile soap,	60 grs.
Camphor,	1 tr. oz.

Oil of origanum, ... 1 f℥
Oil of caraway, ... 2 f℥
Alcohol, ... 12 f℥
Mix, macerate with occasional agitation 7 days, and filter.

Mr. Robt. England gives the following formula, furnished by the late Dr. Jas. Bond, who originally introduced it:

℞
Stronger water of ammonia, } . . . . . āā ℥ij
Olive oil, ... }
Tincture of opium, ... ℥ij
Oil of cinnamon, } . . . . . āā ℥iij
Oil of sassafras, }

From these formulas it will be seen that they must not be confounded as they are so entirely different: one intended for internal use, and the others for liniments and quite active.

Mr. A. B. Taylor read a paper on *Tincture of Nux Vomica.* Mr. McIntyre said that the long and very satisfactory use of the tincture as made by apothecaries from nux vomica, by the old method, showed that this yields trustworthy results.

Prof. Remington said that this subject was brought before the meeting probably in consequence of the late suit held in New Jersey against a druggist of Atlantic City, he having sold tincture of nux vomica containing an average amount of strychnos alkaloids, but not the requisite amount of extractive. Suits had been instituted, both in this country and in Great Britain, against druggists for selling spurious preparations, the instances showing ignorance on the part of those bringing suit, in the selection as test cases of nux vomica merely for a deficiency of extractive matter, and in Great Britain of lac sulphur which is often required to mix readily with water, and then contains calcium sulphate, this impure product being sometimes preferred for the reason stated. Nux vomica would yield different amounts of extract with alcohol differing in strength, a larger percentage of extractive being dissolved by a more aqueous menstruum; and it had even been testified in the case alluded to, that the extractive matter of nux vomica could be taken up without dissolving any alkaloid. The amount of extractive was therefore no criterion of the strength of the tincture, and the directions of the Pharmacopœia had merely been intended as a guide for the pharmacist indicating the exhaustion of the drug, which, with alcohol of the strength directed, would yield about ten per cent. of extract.

Professor Maisch stated that shortly after the publication of the Pharmacopœia of 1880 he had directed attention to the variable quality of extract of nux vomica due to difference in the alcoholic strength of the menstruum, and that therefore the tincture should never be prepared from the extract, unless the latter had been made in strict conformity with the Pharmacopœia. An *aqueous extract of nux vomica* contained a relatively large amount of extractive, and small amount of alkaloids, so that its dose was four times that of the alcoholic extract. Prof. Maisch also called attention to a published account of the testimony given in the suit, in which it was reported that the only medicinal activity of the drug resides in the alkaloids, and that the

extractive matter had absolutely no medicinal effect whatever; and he argued that if such be really the case, a tincture of uniform strength, representing nux vomica, should be made from the alkaloids strychnine and brucine, by dissolving them in some fixed proportion in alcohol.

Mr. Beringer said that he had just finished 200 ounces of tincture of nux vomica, which yielded 2·58 per cent. of extract, and would have to be considerably reduced to make it 2 per cent. as directed by the Pharmacopœia.

Professor Maisch alluded to an experiment made a number of years ago when for a special purpose he prepared extract of nux vomica with strong alcohol, and on evaporating a portion of the tincture in a sand-bath, which was not kept at a uniform temperature, found a portion of the alkaloids had crystallized on the sides of the dish.

Mr. Stevenson, of Pittsburg, was introduced by Professor Remington, and exhibited an improved apparatus for emptying carboys, consisting of a pair of steel rockers joined at one end; he read a paper on this *carboy rocker*, and illustrated its utility by applying it to a carboy, moving this about and tilting it so as to empty its contents.

Mr. Beringer exhibited an improved method of attaching the glass tube to the outer case of the Liebig condenser. It cannot well be described without a drawing.

The following query was submitted: How can this prescription be best compounded—

Liq. plumbi subacetatis,	℥ss
Ext. Opii., " belladonnæ,	āā gr. iiss
Ol. theobromæ,	gr. xl

M. s. a. ft. suppos. vi.

One member suggested that the liquid be concentrated by evaporation, and then the extracts added, and this mixture incorporated with the cacao butter. Another suggestion was that a small quantity of some absorbent power be added, and that probably for each suppository one grain of powdered althea root would be sufficient.

The meeting then adjourned.

T. S. WIEGAND,
Registrar.

EDITORIAL.

American Pharmaceutical Association.—The time is fast approaching when this Association will assemble in its thirty-ninth annual meeting in the city of New Orleans, the day announced being Monday, April 27, at 3 o'clock P. M. This will be the second meeting of the Association since its organization, which is held south of Virginia and Kentucky, the previous one having been at Atlanta, in November, 1878. Those who were present on the latter occasion well remember the attractiveness of Southern fields and forests at a time just prior to the beginning of winter, which induced a number of the visitors to continue their journey still farther south to Florida. This year the members attending the meeting will have the opportunity of seeing Southern fields and forests clad in beauties of spring. It will be the earliest date at which an annual meeting has yet been held, just two months earlier than the meeting of 1889,

which took place in San Francisco. As the latter was well attended from all sections of the United States, taking into consideration the great distances and the time required, so will doubtless the next meeting witness assembled a large number of members from the Eastern, Middle and Western States, in addition to those coming from Louisiana and the neighboring Southern States. The Committee on Arrangements, of which the Local Secretary, Mr. A. K. Finlay, is Chairman, has been at work and outlined a plan by which it is intended to combine pleasant recreation and profitable business. In a circular issued by the committee, it is stated that "New Orleans at that season of the year presents many attractive features, aside from the interesting things to see, which can only be noticed in our quaint old city. You will never regret the time spent in our midst."

The Committee on Transportation, appointed at Old Point Comfort, has been hard at work, and Mr. Alexander has informed us, that he has succeeded in securing for the district of St. Louis, and through Mr. Hogan for that of Chicago, the round trip for a single fare. Negotiations in the other districts were still pending, but expected to be concluded shortly. Propositions for membership have begun to make their appearance at the office of the Secretary of the Committee on Membership. The committees of the different Sections have been quite active, and essays and subjects for profitable discussions will not be lacking. In fact, the prospects for a successful meeting are very encouraging.

The Author of the first Pharmacopœia of the United States of America.—In our volume for 1884, pp. 483–491, we republished in full that little work possessed of historic interest, a copy of which had been loaned to us for the purpose by Dr. Chas. A. Heinitsh. The author of that Pharmacopœia was Dr. Wm. Brown, of whose life, however, we could learn nothing at that time. More recently attention was again called to the above work in the November number, 1890, of "Christian Culture," published at Lancaster, Pa., and this has elicited a biographical sketch of Dr. Brown from one of his descendants, Posey S. Wilson, residing at Denver, Col., which was published in the same periodical, January 1891, p. 8, and from which we make the following abstract:

Dr. William Brown was born in 1748, as the son of Rev. Richard Brown, who had settled near the stream of Bull Run, and was the son of Gustavus Brown, a Scotch physician and surgeon, the latter having come to Virginia when a young man, where he made an enviable reputation as a physician, and was a friend of the Thorntons, Washingtons, Lees, Fairfaxes and Alexanders. William was taught by a private tutor at his father's house, and later was sent to Edinburgh, where he finished his academic education, attended medical lectures, and returned to Virginia to practice his profession in the vicinity of Alexandria, where he intermarried with the Alexander family. When the war of independence came on he offered his services, and, although but twenty-eight years of age, soon rose to a responsible position, having charge of the hospital at Lititz, where he compiled the first Pharmacopœia.

There is little to be said, of popular interest, in the life of a physician, even in time of war. In peace the members of this noble profession are called upon to "set their breast against the thorn," as Tom Hood expresses it; their sacrifice of personal comfort and wishes is constant; their charities innumerable, and their humanity as freely extended to the poor as the rich.

In war these things still follow them; and, in addition, they must go into any danger that may present itself, as gallant as any soldier, and that, too, without the sustaining sense of the compensation of glory for them who die for home and country.

Dr. Brown's services and qualities raised him to the position of Physician-General to the hospitals of the United States, which would at the present time be equivalent to Surgeon-General of both the Army and Navy.

The public services of Dr. Brown told even on his vigorous constitution, for he died at the comparatively early age of forty-three years. He is buried, together with his wife, previously a Miss Alexander, and their daughter Helen, in the quiet old family burying-ground of the descendants of John Alexander —a younger son of the Earl of Sterling—for whom the town of Alexandria was named. It has been stated that, out of his tender love for his little daughter, who had preceded him in death by some seven years, he requested that her body should be disinterred and buried by his side in his own grave. On his tombstone is the following inscription:

IN MEMORY OF
WILLIAM BROWN, M.D.,
Formerly Physician-General to the Hospitals of the
United States, who died on the 11th of January, 1792, in the 44th year of his age,
This tablet is inscribed
by
his affectionate and afflicted widow.
His zeal and fidelity as a patriot;
his patience, diligence and skill as a Physician;
his benevolence, courtesy, and integrity as a man
secured him
the applause of his country,
the honor and endowment of his profession,
the respect of the wealthy,
and
the veneration of the poor.
Let
the grateful witness of his virtues in domestic life
and
that as a husband, father and master,
he was tender, instructive, and humane;
that he lived without guile, and
died without reproach.

This is the daughter of
Dr. William Brown, who lies by his side,
HELEN BROWN,
Died 27th April, 1785, aged 5 years and 15 days.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

The Missouri Botanical Garden. 8vo. Pp. 165.

This handsomely illustrated volume contains a biographical sketch of Henry Shaw, who established the botanical garden at St. Louis; his will, deed for the endowment of a school of botany, inaugural exercises, etc. Under the guidance of Professor Wm. Trelease, both the garden and school will doubtless become important factors for the study of the science of botany in the United States.

Text-Book of Hygiene. A comprehensive treatise on the principles and practice of preventive medicine from an American standpoint. By George H. Rohé, M.D., Professor of Obstetrics and Hygiene in the College of Physicians and Surgeons, Baltimore, etc. (second edition). Thoroughly revised and largely rewritten, with many illustrations and valuable tables. Philadelphia and London: F. A. Davis. 1891. 8vo. Pp. 421. Price, $2.50.

Hygiene is gradually developing into one of the most important branches of the medical sciences. The work now before us is a trustworthy exponent of what has been accomplished in this direction; or what is known in regard to the numerous agencies influencing the health of mankind, such as air, water, food, soil, sewage, dwellings, clothing, contagion, etc., and the means for preventing disease, like quarantine, antiseptics, disinfectants, etc. The work is tersely written. The statements are clear and to the point, without being encumbered by prolixity. It is a work that seems to be well adapted to the wants of the student, and for awakening an interest, where it does not already exist, into deeper inquiries into the ultimate causes of disease, and the correct means of preserving health.

First Annual Report of the State Dairy and Food Commissioner of Wisconsin. 1890. 8vo. pp. 114.

The report was made to Governor Hoard by the Commissioner, H. C. Thom, and refers to dairy products and to articles of medicines and of food, or used in the preparation of food.

Proceedings of the Iowa State Pharmaceutical Association, held at Des Moines, February 12 and 13, 1890. Eleventh Annual Meeting. 8vo. Pp. 134.

An account of the meeting will be found on page 200 of our last volume.

Proceedings. Ninth annual meeting of the Massachusetts State Pharmaceutical Association, held in Brittan Hall, Haverhill, June 18–20, 1890. Pp. 209.

A brief report of this meeting will be found on page 427 of our last volume. A pamphlet of 24 pages has been added, giving the proceedings of a special meeting of the same Association, held in Boston, Dec. 2, at which the subject of co-operation was discussed, and a committee of fifteen was appointed relative to the organization of a corporation.

Proceedings of the Michigan State Pharmaceutical Association, at its eighth annual meeting, held at Saginaw, Sept. 16–18, 1890. Pp. 95.

One of the papers read at this meeting, viz: "On the iodine absorption of essential oils as a criterion of purity," by H. W. Snow, was published in our November number. The officers of the Association for the present year are D. E. Prall, Saginaw, president; Chas. A. Bugbee, Cheboygan, secretary; Wm. Dupont, Detroit, treasurer; and Henry J. Brown, local secretary. The

next meeting will be held in Ann Arbor, in October next, the date to be fixed by the Executive Committee.

Proceedings of the National Wholesale Druggists' Association, in convention at the Arlington Hotel, Washington, D. C., Sept. 29 to Oct. 3, 1890. Pp. 271.

The next meeting will take place in Louisville, at a date to be fixed by the Committee on Entertainment. Daniel Stewart, Indianapolis, is president; A. B. Merriam, Minneapolis, secretary, and S. M. Strong, Cleveland, treasurer for the present year.

Commentar zum Arzneibuch für das deutsche Reich (Pharmacopœa Germanica, Editio III). Von Dr. Bruno Hirsch und Dr. Alfred Schneider, Göttingen. Vandenhoeck & Ruprecht.

Commentary to the German Pharmacopœia, etc.

In our December number we have noticed the appearance of the first two fascicles of this excellent commentary; we have now before us six additional issues, pages 129 to 448, which bring the work to mentholum in the same commendable manner as indicated in our previous notice.

Recherches sur le Strongle Paradoxal. Thèse, etc., par Marie-Eugène Daniel. 4to. Pp. 51.

Contribution à l'étude anatomique des Polygalacées. Thèse, etc., par Charles Jules Feuilloux. 4to. Pp. 43.

Two theses from the Paris *École Supérieure de Pharmacie* for the diploma of pharmacien of the first class. The former is a monograph of the paradoxal strongylus, a worm which has been repeatedly observed in man, and which, besides other names, is known as St. longevaginatus, *Diesing*. The other thesis treats of the anatomy of five commercial varieties of krameria, and of three species of polygala, including senega root, and four impurities and adulterations of this drug. Both works are illustrated with cuts representing the microscopical structure of the objects under investigation.

Heredity, Health and Personal Beauty. By John V. Shoemaker, A.M., M.D., Professor of Materia Medica, Pharmacology, Therapeutics and Clinical Medicine and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College of Philadelphia, etc. Philadelphia and London: F. A. Davis, Publisher. 1890. 8vo. Pp. 422. Price, cloth, $2.50; half morocco, $3.50.

In the introduction we are told that the aim of the work was to impart some information strictly limited to the non-scientific world. Yet the author has found it necessary to take notice of several recent essays in regard to the inheritable effects of the use and disuse of vital parts by an organism, and in relation to the heredity of congenital characters and of acquired characters. Several statements, and more especially conclusions arrived at in a work by August Weismann on "Heredity and Kindred Biological Problems," are frankly criticised, the author expressing his views, in connection with the subject-matter of his work, by stating that "If men and women did not mate for love and money and a thousand other motives than with reference to the qualities of their descendants, but, like the domesticated animals, were bred for various qualities, we could make great musicians, painters,

mathematicians, generals or athletes, at pleasure, unchecked save by the occasional effect of ataxism. Although this will never be, we may yet clearly perceive, if we but observe closely, with minds divested of prejudice, the working of the indicated law, which, as it has ever done, holds important sway at all times and in all places on earth."

It must be understood at the outset that the work is not a treatise on evolution; yet from its title it can be plainly seen that questions and facts must be discussed which are likewise involved in the former theory. Refraining from abstruse discussions, the author endeavors to elucidate the relations of causes and effects, regarding health and beauty in man, and drawing his illustrations from the savage and the cultured, and from all conditions of society, reaches his conclusions in a persuasive and convincing manner. It is impossible to enter into details in this place; reference must be had to the work itself; but it should be stated that all questions involved are discussed with frankness and delicacy combined.

The subjects of the thirty-seven chapters may be briefly summarized as follows: Laws of health, life and growth; man's spiritual and physical place in nature; phenomena of evolution; environment, training, gracefulness, walking, dressing, bathing; the aspect, cosmetic care and treatment of the face, hands, feet, nails, hair, etc.; food, clothing, ventilation, and three chapters on cosmetic articles, medicated soap and household remedies. The make-up of the work is quite attractive.

Staunton, Virginia; its past, present and future. By Armistead C. Gordon. With illustrations from photographs, by Edmund Berkeley. Designed, illustrated and printed by the South Publishing Co., New York.

The work, which is very handsomely illustrated, the text being historical and descriptive, is issued by the Staunton Development Co., whose Eastern office is in Philadelphia, D. Z. Evans, Jr., agent.

Some experimental Tests of the Pasteur Filter. By L. E. Sayre and V. L. Kellogg. Pp. 7.

Reprint from the Transactions of the Kansas Academy of Science, 23d annual meeting.

The Treatment of the Morphine-disease. By J. B. Mattison, M.D., Brooklyn, N. Y.

Reprint from the *Therapeutic Gazette.*

Abnormal intra-thoracicair-pressures and their treatment. By Chas. Denison, A.M., M.D., Denver, Col.

This is the president's address at the seventh annual meeting of the American Climatological Association; reprinted from *The Sanitarian.*

VARIETIES.

Malic acid lozenges have recently found considerable favor in England as a remedy for sore throat and bronchial cough. They are reported as efficient not only in excessive secretion of mucus and cough, but also in catarrhal conditions of the bowels and in hæmorrhoids.—*Jour. Am. Med. Assoc.*, Jan. 10, 1891.